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The definitions of uniformity (absolute and relative) may be simplified by omitting '$\exists\ m_n \ni$' and replacing 'σ_{m_n}' by 'σ_n'. This form of definition is suggested directly by (4); the more complicated form (5) with its redundant existential feature m_n serves however to suggest the definitions of semiuniformity (absolute and relative), and relative semiuniformity proves to be of importance in the applications.

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[1] M. Fréchet, Sur quelques points du calcul fonctionnel, *Palermo, Rend. Circ. mat.*, **22**, 1–74 (1906).

[2] E. H. Moore, Introduction to a Form of General Analysis, 1–150, *The New Haven Mathematical Colloquium*, Yale Univ. Press, 1910. Cf. also, E. H. Moore, On a Form of General Analysis with Application to Linear Differential and Integral Equations, *Atti* IV *Cong. Inter. Mat.* (Roma, 1908), **2**, 98–114 (1909).

[3] E. H. Moore, On the Foundations of the Theory of Linear Integral Equations, *Bull. Amer. Math. Soc.*, Ser. 2, **18**, 334–362, (1912). On the Fundamental Functional Operation of a General Theory of Linear Integral Equations, *Proc. Fifth Inter. Congr. Math.* (Cambridge, Aug., 1912) **1**, 230–255 (1913).

NOTICE OF SCIENTIFIC MEMOIR

The Variations and Ecological Distribution of the Snails of the Genus Io. By Charles C. Adams, New York State College of Forestry, Syracuse, N. Y. Second Memoir of Volume 12 of the Memoirs of the National Academy of Sciences, Washington, 1915. 1–184 p., 64 pl.

Io is a large gilled snail which lives only in the Tennessee River system. It is extremely variable, shows a remarkable distribution in the streams and in this it appears to be related to the physical history of the drainage. Throughout this Memoir emphasis is placed upon relating the changes of the animals to the changes in the environment. The general natural history of the snails is briefly summarized, the local races are described and the localities from which the collections studied were secured is given in detail. The shells were grouped in convenient classes for descriptive purposes. The diameter of the shell, its degree of globosity, and the degree of development of the spines were determined quantitatively. These qualities are discussed by streams and drainage systems. In the parallel flowing Powell, Clinch and (North Fork) Holston rivers, the shells are smooth or with low spines in the headwaters, and down stream have longer spines. This condition is quite remarkable and no previous detailed investigation has been made of a problem of this character.

The development or evolution of the gross environment is discussed. The author states "It is considered that a knowledge of the development and structure of the environment is as essential a part of the problem as is the development and structure of the animals themselves." An outline history of the Tennessee drainage is given. In the past this family of shells was thought to have originated in the Northwest (Laramie) but the author suggests an alternative hypothesis, that they originated in the southeast.

Large numbers of immature shells were secured in order to study the development of the shell and its sculpture. Certain shells are smooth or without sculpture in the early stages, some remain smooth, others develop nodules or spines either early or late in life, or even develop a sculpture and later lose it. Other shells are spinose from the start and remain so. The loss of sculpture occurs largely in one locality, in the vicinity of which drainage changes have probably occurred in relatively recent geological time.

In the general discussion and summary a brief review is given of inheritance in molluscs, as Mendelian inheritance applies to many of their characters. The results of recent experimental breedings are applied to the interpretation of the variations of these shells. Other topics discussed are agencies and means of dispersal, longitudinal distribution in streams, causes of variation, geographic range and variation of each of the forms of *Io*, the migration of the environment and migrations and relationships of the various forms. The illustrations include figures of the shells, showing the ontogeny of shell sculpture, and samples of the shell population at representative localities. Diagrams and tables illustrate the quantitative relations and there are several maps. The great diversity seen in these shells is probably related to the complex mixtures of many strains which has been made possible by the complex stream history.

REPORT OF THE AUTUMN MEETING

Prepared by the Home Secretary

The Autumn Meeting of the Academy was held in the American Museum of Natural History at New York City, on November 15, 16, 17, 1915.

Forty-eight members were present, as follows: C. G. Abbot, Becker, Boas, Boltwood, Britton, Castle, Cattell, Chittenden, W. B. Clark, F. W. Clarke, J. M. Clarke, Conklin, Coulter, Crew, Cross, Davenport, Day, Donaldson, Hague, Harper, Harrison, Hillebrand, Holmes, Howell, Iddings, Lindgren, Loeb, Lusk, Mall, Mendel, Michelson, Morgan, Morse, A. A. Noyes, H. F. Osborn, T. B. Osborne, Pickering, Ransome, Reid, Richards, Rosa, Schuchert, Theobald Smith, Van Hise, Walcott, Webster, Wheeler, H. S. White.

BUSINESS SESSION.

The Home Secretary announced that since the Annual Meeting in April the Academy had lost by death two members, John Ulric Nef, elected 1904, who died on August 13, 1915, and Frederick Ward Putnam, elected 1885, who died on August 18, 1915; also two foreign associates, Theodor Boveri, elected 1913, who died on October 15, 1915, and Paul Ehrlich, elected 1904, who died on August 20, 1915.

The Home Secretary made also the following announcements: That Mr. Edwin B. Frost had been elected Chairman of the Directors of the Bache Fund and Mr. Arthur Gordon Webster had been elected to succeed Mr. Ira Remsen.